What we claim is:

1. A method for compensating for polarisation mode dispersion in a birefringent optical transmission fibre, comprises controlling the birefringence of the fibre.

2. A method as claimed in Claim 1, further comprising the step of monitoring the difference in group velocity of orthogonal polarisation states of an optical signal transmitted over said fibre, generating an error signal representing said difference, and adjusting the birefringence of the fibre to minimise said difference, whereby to provide dynamic compensation for polarisation mode dispersion.

3. A birefringent optical transmission fibre provided with means for controlling the birefringence of said fibre, whereby to compensate for polarisation mode dispersion in said fibre.

4. A fibre as claimed in Claim 3, wherein said means for controlling birefringence comprises a non-linear fibre grating written into the fibre whereby to provide a means for imposing a differential time delay to orthogonal polarisation states arising from the effects of polarisation mode dispersion such as to compensate for said polarisation mode dispersion.

5. A fibre as claimed in Claim 3, wherein said birefringence is imposed in the fibre by selection from any of the group consisting of: introducing correctly positioned holes in the fibre so as to create a side hole fibre (SHF), a holey fibre (HF), a photonic crystal fibre (PCF), or any other suitable microstructure fibre.

6. A fibre as claimed in Claim 3, wherein said grating is selected from the group consisting of a chirp type grating and an apodisation type grating.

7. A fibre as claimed in Claim 3, wherein said means for controlling the birefringence of the fibre is selected from the group consisting of: mechanically operated means, electrically operated means, thermally operated means and acoustically operated means.

8. A fibre as claimed in Claim 3, wherein the fibre is tapered over at least part of its length.

9. A fibre as claimed in Claim 5, wherein said fibre is a holey fibre comprising micro-holes filled with thermally sensitive material to create stressing rods whereby to impose a mechanical stress by which to control birefringence.

10. A fibre as claimed in Claim 3, provided with means to provide a thermal gradient over at least part of the length of the fibre.

11. A fibre as claimed in Claim 5, wherein said fibre is a holey fibre comprising micro-holes filled with material and constructed such that a fundamental transmission mode of said fibre interacts with said material in said micro-holes so as to induce an electro-optic effect whereby to alter the mode shape and the birefringence of the fibre.

12. A fibre as claimed in Claim 3, wherein said fibre is further provided with additional means to control the birefringence thereof.

13. A fibre as claimed in Claim 12, wherein said additional means comprise stress rods, whereby to alter the modal field pattern and therefore the birefringence of the fibre.

14. An optical transmission system incorporating a birefringent optical transmission fibre as claimed in Claim3.

15. An optical signal having traversed a birefringent optical transmission fibre as claimed in Claim3.

16. An optical communication system incorporating a birefringent optical transmission fibre provided with means for controlling the birefringence of said fibre; a sensor for sensing a difference in group velocity of orthogonal polarisation states of optical signals travelling in said fibre; an error signal generator for generating an error signal indicative of the sensed difference; said means for controlling the birefringence of the fibre being responsive to said error signal to tend to reduce the sensed difference in group velocity to zero, whereby to compensate for polarisation mode dispersion in said fibre